

Remarks

Claims 1-10 are pending.

Claims 1 and 10 are amended.

Claims 2-8 are original.

Claim 1 is amended for clarity by inserting appropriate Markush language.

Claim 10 is amended for clarity by inserting the phrase "is a compound which" immediately after the word radical in line 1. Support is inherent in the application, e.g., pages 6-10.

No new matter is added.

Rejections

Claim 1 is rejected under 35 USC 112 second paragraph for improper Markush language. Applicants respectfully submit that, in light of the above amendments, the rejections are addressed and are overcome and kindly ask that the rejections of claim 1 under 35 USC 112 second paragraph be withdrawn.

Claim 10 is rejected under 35 USC 112 second paragraph for using improper open language. Applicants respectfully maintain that claim 10 properly limits the instant process wherein the nitroxyls that are produced are compounds which contain a nitroxyl functionality that is a part of a 6 membered ring. Other residues may be present and joined at the asterisk in the formula (X) as described in the specification, for example by the formulae of page 7-10 and elsewhere.

Applicants respectfully submit that the rejections of claim 10 under 35 USC 112 second paragraph are overcome and kindly ask that the rejections be withdrawn.

Claims 1-10 are rejected under 35 USC 102(b) as being anticipated by Gillet et. al., US 6,538,141 which is the US equivalent of WO 00/40550 discussed at the bottom of page 1 of the instant specification.

Applicants respectfully traverse the rejections.

US 6,538,141 discloses a process wherein a solution of a peracid and a separate solution of a base, for example an aqueous solution of an alkali metal carbonate or bicarbonate, are simultaneously added to a two phase emulsion of water and amine which is pre-dissolved in an appropriate organic solvent. The dosing rates of peracid and base are regulated in such a way that the pH is maintained in the range of 4 to 12., column 3, lines 4-14 of '141.

In the instant process, the base is added in total as a solid or slurry to the amine and an optional organic solvent. The base is never dissolved in water, thus limiting the amount of water needed. The peracid is then added to this mixture.

Thus, the two processes are not identical and Applicants respectfully aver that no anticipation exists.

Applicants further respectfully submit that the differences in the two processes are not trivial in their impact on the preparation of the nitroxyl as described in pages 1-5 of the instant specification.

As described on page 2, lines 3-11 of the instant specification, the process of US 6,538,141 (the equivalent of WO 00/405500), has drawbacks making the process of '141 less attractive for large-scale industrial oxidation which drawbacks include: the necessity of an apparatus equipped with two dosing units; the difficulty of a reliable pH-measurement in heterogeneous mixtures; and the relatively low solubility of alkali metal carbonates or hydrogen carbonates in water resulting in large volumes of solutions and therefore low volume yield.

As described in the instant specification on page 1, paragraphs 4 and 5, the successful oxidation of an amine with a peracid requires that the pH of the reaction mixture be controlled. Therefore, the presence the correct amount of weak base available to the reaction is an essential component to the successful and efficient conversion to nitroxyl. Thus, the process element that allows for successful preparation of the nitroxyl is a significant component of any process.

Applicants have discovered that having the base present as a solid or slurry and not as part of a solution effectively controls the amount of base released to the reaction. This provides both a more effective and more easily controlled process for proper pH control, and also provides tangible benefits such as simpler reaction vessel design, only one dosing unit is needed; less complicated processing steps; and higher volume yield by eliminating much of the water required in the '141 process.

To elaborate on the issue of water volume, Applicants respectfully refer to page 4 and 5 of the instant specification. The minimal volume of water in the process disclosed in '141 for a given amount of bicarbonate is determined by its solubility in water at the given temperature. For example, when sodium bicarbonate (NaHCO_3) is used as base, the weight ratio of NaHCO_3 to water is typically from 1.5 : 1 to 0.75 : 1. The amount of water needed for carbonates of alkaline earth metals, for example CaCO_3 , MgCO_3 or Dolomite ($\text{CaCO}_3 \times \text{MgCO}_3$) have such a low solubility in water that usefully concentrated solutions cannot be prepared.

In contrast, the instant invention uses only enough water to dissolve the salts resulting from neutralization of the acids derived from the added peracid, for example, an acetate salt and not a bicarbonate salt. Tables 1 and 2 of the instant invention illustrate the differences in solubilities of these salts and the different amounts of water needed for the process of '141 (i.e., WO 00/40550) and the instant process.

Applicants respectfully submit that in light of the above discussion the rejections under 35 USC 102(b) over Gillet et. al., US 6,538,141 are overcome and kindly ask that they be withdrawn.

Applicants respectfully submit that all rejections are overcome and that the instant invention provides a significant contribution to the art and therefore kindly ask that all rejections be withdrawn and claims 1-10 be found allowable.

In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

Respectfully submitted,



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